

CLAIMS

What is claimed is:

1 1. A process for controlling the volume of the flow of dry air, dried to a
2 predetermined degree of dryness, emanating from a sweep manifold of an air dryer
3 system, flowing over a plurality of gaseous/liquid fluid separating membranes of said air
4 dryer system, said process comprising:

5 a. diverting a predetermined volume of dried air, at a predetermined pressure, to a
6 sweep manifold;

7 b. sensing one of the flow volume and the humidity values of the remainder of said
8 dried air and converting said one of said flow volume and humidity values to
9 electrical signals, and;

10 c. using a controller, for achieving the predetermined degree of dryness of said air,
11 and utilizing said electrical signals for controlling at least one solenoid valve
12 which in turn controls the flow volume of said predetermined volume of dried air
13 diverted to said sweep manifold.

1 2. The process of claim 1, wherein said sensing is the sensing of said flow volume
2 and said controller controls the duty cycle of said at least one solenoid valve, thereby
3 controlling said flow volume values over said membranes.

1 3. The process of claim 2, wherein said duty cycle comprises repeating cycles of
2 on/off operation.

1 4. The process of claim 1, wherein said sensing is the sensing of said flow volume
2 and said controller controls at least two solenoid valves associated with different sized
3 orifices, respectively.

1 5. The process of claim 4, wherein said controller, by sequencing said at least two
2 solenoid valves, controls said flow volume values over said membranes.

1 6. The process of claim 5, wherein said sequencing includes pluralities of
2 operational and non-operational combinations of said solenoid valves.

1 7. The process of claim 1, wherein said sensing is the sensing of said humidity
2 values and said controller controls the duty cycle of said at least one solenoid valve,
3 thereby controlling said flow volume values over said membranes.

1 8. The process of claim 7, wherein said duty cycle comprises repeating cycles of
2 on/off operation.

1 9. The process of claim 1, wherein said predetermined degree of dryness is
2 measured in terms of one of humidity and dew point at a specified temperature and
3 pressure.

1 10. A process for controlling the volume of the flow of dry air, dried to a
2 predetermined degree of dryness, emanating from a sweep manifold of an air dryer
3 system, flowing over a plurality of gas/liquid fluid separating membranes of said air dryer
4 system, said process comprising:

5 a. diverting a predetermined volume of dried air, at a predetermined pressure, to a
6 sweep manifold;

- b. sensing the differential pressure within said air dryer system; and
- c. utilizing said differential pressure to control the flow volume of said predetermined volume of dried air diverted to said sweep manifold.

11. The process of claim 10, wherein said flow volume control is performed via a proportional flow control valve.

12. The process of claim 11, wherein said differential pressure sensing includes passing air through a restriction.

13. The process of claim 12, wherein said restriction is located within said proportional flow control valve.

14. The process of claim 13, wherein said restriction is a fixed restriction.

15. The process of claim 12, wherein said restriction is located in a location other than said proportional flow control valve.

16. The process of claim 10, wherein said sensing of said differential pressure is accomplished between two points within said air dryer system.

17. A process for controlling the volume of the flow of dry air, dried to a predetermined degree of dryness, emanating from a sweep manifold of an air dryer

3 system, flowing over a plurality of gas/liquid fluid separating membranes of said air
4 dryer, said process comprising:

- 5 a. diverting a predetermined volume of dried air to a sweep manifold;
- 6 b. sensing one of the flow volume and humidity values of the remainder of said
7 dried air or the pressure differential within said air dryer system; and
- 8 c. utilizing one of said differential pressure to control the flow volume of said
9 predetermined volume of dried air and utilizing a controller for achieving the
10 predetermined degree of dryness of said air by controlling at least one solenoid
11 valve which, in turn, controls the flow volume of said predetermined volume of
12 dried air diverted to said sweep manifold.

1 18. The process of claim 17, wherein said diverting, of a predetermined volume of
2 dried air to a sweep manifold, is accomplished at a predetermined pressure.

1 19. The process of claim 17, wherein said sensing is the sensing of said flow volume,
2 and said controller controls at least two solenoid valves, associated with differing size
3 orifices, respectively.

1 20. The process of claim 19, wherein said controller, by predetermined sequencing
2 said at least two solenoid valves, controls said flow volume.

1 21. The process of claim 20, wherein said predetermined sequencing includes
2 pluralities of operational and non-operational combinations of said solenoid valves.

1 22. The process of claim 17, wherein said sensing is the sensing of said flow volume
2 and said controller controls the duty cycle of said at least one solenoid valve, thereby
3 controlling said flow volume of said dry air over said membrane.

1 23. The process of claim 22, wherein said duty cycle comprises repeating cycles of
2 on/off operation.

1 24. The process of claim 17, wherein said sensing is the sensing of said humidity
2 values and said controller controls the duty cycle of said at least one solenoid valve,
3 thereby controlling said flow volume of said dry air over said membrane.

1 25. The process of claim 24, wherein said duty cycle includes pluralities of repeating
2 cycles of on/off operation.

1 26. The process of claim 17, wherein said sensing is the sensing of the differential
2 pressure within said air dryer system.

1 27. The process of claim 26, wherein said utilizing is the utilizing of said differential
2 pressure to control said flow volume.

1 28. The process of claim 27, wherein said flow volume control is accomplished via a
2 proportional flow control valve.

1 29. The process of claim 28, wherein said differential pressure sensing includes
2 passing air through a restriction.

1 30. The process of claim 29, wherein said restriction is located within said
2 proportional flow control valve.

1 31. The process of claim 30, wherein said restriction is a fixed restriction.

1 32. The process of claim 28, wherein said restriction is located in a location other
2 than said proportional flow control valve.

1 33. The process of claim 17, wherein said sensing of differential pressure is
2 accomplished between two points within said air dryer system.

1 34. The process of claim 17, wherein said predetermined degree of dryness is
2 measured in terms one of humidity and dew point, at a specified temperature and
3 pressure.